

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (currently amended) A storage subsystem which is connected to a host computer through a communication line, comprising

an interface which is used for connecting to said communication line, wherein,
said interface comprises a first filter which judges, on the occasion of having received communication packets from said communication line, whether there is a communication packet with a predetermined format for use in an access to said storage subsystem, among the communication packets;

wherein said interface further comprises

a traffic measuring and judging unit which measures traffic of all communication packets received in the interface, and traffic of a communication packet judged not to be the packet with said format in said first filter, respectively, and by using the both traffics, judges whether a communication failure is generated or not, and

a communication failure alerting unit which alerts a management server connected to said storage subsystem and comprises a function of displaying information alerted, in case that it is judged that a communication failure is generated in said traffic measuring and judging unit.

2. (original) The storage subsystem according to Claim 1, wherein,
said interface further comprises a second filter which receives the communication packet judged to be for said access in said first filter, and judges whether it is a communication packet permitted to access to a storage area in said storage subsystem and transmitted from said host computer or not.

3. (original) The storage subsystem according to Claim 2, wherein, in case that said host computer is permitted to access to said storage subsystem, said interface further comprises an access permission table having information which uniquely specifies the host computer, and information which specifies a storage area in said storage subsystem to which the host computer is permitted to access, and

said second filter judges whether a communication packet judged to be for use in said access is transmitted from the host computer permitted to access or not, in accordance with information stored in said access permission table.

4. (canceled)

5. (currently amended) The storage subsystem according to Claim [[4]] 1, wherein,

said traffic measuring and judging unit further measures traffic of a communication packet judged not to be the communication packet transmitted from said host computer which is permitted to access in said second filter, and by using the traffic and said traffic of all communication packets, further judges whether a communication failure is generated or not.

6. (original) The storage subsystem according to Claim 5, wherein, said interface further comprises a traffic log recording unit which records, as a traffic log, communication information of a communication packet judged not to be the communication packet with said format in said first filter and a communication packet judged not to be the communication packet transmitted from said host computer permitted to access in the second filter.

7. (original) A management server connected to the storage subsystem according to Claim 6, wherein,

an improper communication source analyzing unit which refers to said traffic log, in case that it is alerted from a communication failure alerting unit of said storage subsystem that a communication failure is generated, and searches a source of said communication packet causes the communication failure.

8. (original) The management server according to Claim 7, further comprising,

a relay device control unit which controls, based on information of a source searched in said improper communication source analyzing unit, a relay device which relays communication to said storage subsystem disposed on said communication line so as to cut off communication from the source.

9. (currently amended) A computer readable storage medium including a program [[in]] for a computer mounted on a storage subsystem connected to a host computer through a communication line, functioned as the program comprising:

interface means which connects code for connecting to said communication line;[[, and]]

first filtering means which judges code for judging, on the occasion of having received communication packets from said communication line through said interface means connecting to said communication line, whether there is a communication packet with a predetermined format for use in an access to said storage subsystem, among the communication packets;

code for receiving the communication packet judged to be for said access in said judging, and judges whether it is a communication packet permitted to access to a storage area in said storage subsystem and transmitted from said host computer or not;

code for measuring traffic of all communication packets received in connecting to said communication line, and traffic of a communication packet judged not to be the packet with said format in said first filter, respectively, and by using the both traffics, judging whether a communication failure is generated or not; and

code for alerting a management server connected to said storage subsystem and displaying information alerted, in case that it is judged that a communication failure is generated in measuring said traffic of all communications packets received in connecting to said communication line.

10. (canceled)

11. (canceled)

12. (currently amended) A computer readable storage medium including a program [[in]] for a computer mounted on a management server which is connected to a storage subsystem, functioned as the program comprising:

~~source searching means which refers code for referring~~ to said traffic log, in case that it is alerted from a communication failure alerting unit of said storage subsystem that a communication failure is generated, and searches searching a source of said communication packet which causes the communication failure.

13. (currently amended) A computer readable storage medium including a program which has for a computer[[,]] mounted on a management server which is connected to a storage subsystem, functioned as the program comprising:

~~source searching means which refers code for referring~~ to said traffic log, in case that it was alerted from a communication failure alerting unit of said storage subsystem that a communication failure is generated, and searches searching a source of said communication packet which causes the communication failure, and

~~relay device control means which controls code for controlling~~, based on information of a source searched in said ~~source searching means searching~~, a relay device which relays communication to said storage subsystem disposed on said communication line for receiving a communication packet so as to cut off communication from the source.

14. (canceled)

15. (currently amended) A storage system in which a storage subsystem, a host computer, and a management server are connected by a communication line, wherein,
said storage subsystem comprises an interface which connects to said communication line, and

said interface comprises,

a first filter which judges, on the occasion of having received communication packets from said communication line, whether there is a communication packet with a predetermined format for use in an access to said storage subsystem, among the communication packets,

a second filter which receives the communication packet judged to be for said access in said first filter, and judges whether it is a communication packet permitted to access to a storage area in said storage subsystem and transmitted from said host computer or not,

a traffic measuring and judging unit which measures traffic of all communication packets received in the interface, and traffic of a communication packet judged not to be the packet with said format, respectively, and by using the both traffics, judges whether a communication failure is generated or not,

a communication failure alerting unit which alerts said management server, in case that it is judged that a communication failure is generated in said traffic measuring and judging unit, and

a traffic log recording unit which records, as a traffic log, communication information of a communication packet judged not to be the communication packet with said format in said first filter and a communication packet judged not to be the communication packet transmitted from said host computer permitted to access in the second filter, and

said management server comprises

a display device which displays the alert received from said communication failure alerting unit,

an improper communication source analyzing unit which refers to said traffic log, in case that it is alerted from a communication failure alerting unit of said storage subsystem that a communication failure is generated, and searches a source of said communication packet which causes the communication failure, and

a relay device control unit which controls, based on information of a source searched in said improper communication source analyzing unit, a relay device which relays communication to said storage subsystem disposed on said communication line so as to cut off communication from the source.

16. (original) The storage system according to Claim 15, wherein, in case that said host computer is permitted to access to said storage subsystem, said interface further comprises an access permission table having information

which uniquely specifies the host computer, and information which specifies a storage area in said storage subsystem to which the host computer is permitted to access, and

 said second filter judges whether a communication packet judged to be for use in said access, is transmitted from the host computer permitted to access or not, in accordance with information stored in said access permission table.

17. (original) The storage system according to Claim 15, wherein,
 said traffic measuring and judging unit further measures traffic of a communication packet judged not to be the communication packet transmitted from said host computer permitted to access in said second filter, and by using the traffic and said traffic of all communication packets, further judges whether a communication failure is generated or not.

18. (original) The storage system according to Claim 17, wherein,
 said traffic measuring and judging unit further measures traffic of a communication packet judged to be the communication packet transmitted from said host computer permitted to access in said second filter, and by using the traffic and said traffic of all communication packets, judges whether a value of a ratio of traffic of a communication packet transmitted from said host computer permitted to access to traffic of all communication packets is less than a predetermined value or not, and

 said communication failure alerting unit alerts said management server of the alert which indicates that second communication failure is generated, in case that it is judged that the value of the ratio is less than the predetermined value in the traffic measuring and judging unit, and

 said management server further comprises a QoS condition designating unit which, in case of having received the alert which indicates that the second communication failure is generated from said communication failure alerting unit, readjusts a network QoS between said storage subsystem and said host computer, which has been set up in advance by an administrator.

19. (currently amended) A communication control method in a storage system in which a storage subsystem, a host computer, and a management server are connected by a communication line, comprising the steps of:

judging, when communication packets from said communication line were received in said storage subsystem, whether there is a communication packet with a predetermined format for use in an access to said storage subsystem, among the communication packets,

measuring traffic of all communication packets received by said storage subsystem, and traffic of a communication packet judged not to be the packet with said predetermined format, respectively, and recording a traffic log of a communication packet judged not to be the communication packet with said format,

judging, by using said measured both traffics, whether a communication failure is generated or not, and alerting said management server, in case that it is judged that a communication failure is generated,

referring to said traffic log, in case that the alert that the communication failure is generated is received in said management server from said storage subsystem, and searching information of a source of said communication packet which causes said communication failure, and

controlling, based on information of the searched source, a relay device which relays communication to said storage subsystem disposed on said communication line so as to cut off communication from the source.

20. (currently amended) A storage system having a storage subsystem connected to a host computer through a communication line, and a management server connected to said storage subsystem, wherein,

said storage subsystem comprises an interface which connects to said communication line and a maintenance terminal which maintains said storage subsystem, and said interface comprises

a first filter which judges, on the occasion of having received communication packets from said communication line, whether there is a communication packet with a predetermined format for use in an access to said storage subsystem, among the communication packets,

a second filter which receives the communication packet judged to be for said access in said first filter, and judges whether it is a communication packet permitted to access to a storage area in said storage subsystem and transmitted from said host computer or not,

a traffic measuring and judging unit which measures traffic of all communication packets received in the interface, and traffic of a communication packet judged not to be said communication packet permitted to access in said second filter, respectively, and calculates a value of a ratio of the both traffics (communication ratio), and by using the both traffics, judges whether a communication failure is generated or not, and

a communication failure alerting unit which alerts said maintenance terminal, in case that it is judged that a communication failure is generated in said traffic measuring and judging unit, of that failure is generated and said communication ratio, and

said maintenance terminal comprises a warning message reporting unit which generates, in case that the alert of that a communication failure is generated and said communication ratio is received from said communication information and failure alerting unit, a warning message in accordance with said alert, and outputs it to said management server, and

said management server comprises:

an output device,

a failure information displaying unit which comprises said output device displayed the warning message and said communication ratio received from said warning message reporting unit, and

a QoS condition designating unit which judges whether said communication ratio is within a predetermined permissible zone, and in case that it is judged to be outside the permissible zone, adjusts a network QoS of a relay device which relays communication to said storage subsystem disposed on said communication line.

21. (new) The storage subsystem according to Claim 1, wherein a header of the communication packet with the predetermined format includes information which shows that an iSCSI command is encapsulated in the communication packet.

22. (new) The storage system according to Claim 18, wherein a header of the communication packet with the predetermined format includes information which shows that an iSCSI command is encapsulated in the communication packet.